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Configuring Polled AOT Transport Services

NORTEL NETWORKS™

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Preface

This guide describes how to customize Nortel Networks™ router software for polled Asynchronous over TCP/IP (AOT) transport services.

Before You Begin

Before using this guide, you must complete the following procedures. For a new router:

- Install the router (see the installation guide that came with your router).
- Connect the router to the network and create a pilot configuration file (see *Quick-Starting Routers*, *Configuring BayStack Remote Access*, or *Connecting ASN Routers to a Network)*.

Make sure that you are running the latest version of Nortel Networks BayRS™ and Site Manager software. For information about upgrading BayRS and Site Manager, see the upgrading guide for your version of BayRS.

Text Conventions

This guide uses the following text conventions:

bold text	Indicates command names and options and text that you need to enter. Example: Enter **show ip** {**alerts** | **routes**}. Example: Use the **dinfo** command.
italic text	Indicates file and directory names, new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is: **show at** <*valid_route*> *valid_route* is one variable and you substitute one value for it.
`screen text`	Indicates system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is: **show ip** {**alerts** | **routes**}, you enter either: **show ip alerts** or **show ip routes**, but not both.

Acronyms

This guide uses the following acronyms:

AOT	Asynchronous over TCP/IP
CU	control unit
FEP	front-end processor
IP	Internet Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
WAN	wide area network

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Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-7041

Chapter 1
Polled AOT Overview

This chapter describes polled Asynchronous over TCP/IP (AOT) transport services. It contains the following sections:

Section	Page
Polled AOT Networking	1-1
Polled AOT Configurations on Nortel Networks Routers	1-3
Polled AOT Device Support	1-4

You should review this chapter if you are responsible for configuring polled AOT on one or more Nortel Networks routers. If you are already familiar with polled AOT concepts, you can go directly to Chapter 2, “Enabling Polled AOT,” for information about starting polled AOT on Nortel Networks routers.

Polled AOT Networking

Polled AOT is a wide area network (WAN) protocol that enables transport of asynchronous data packets over a TCP/IP network. Unlike synchronous transmission, asynchronous transmission does not use clocking signals to time the data transmission. Instead, asynchronous transmission uses start and stop bits to control the transmission.

Polled AOT transmissions use TCP timers and keepalive settings to ensure that there is an active TCP connection between two routers before any transmission attempt. The router that you designate as the primary router transmits polls to a secondary router over the active TCP connection. Because asynchronous transmissions are relatively slow (300 b/s to 9600 b/s), polling ensures that the secondary router is available for asynchronous transmission.

In one sample application (Figure 1-1), banks can use polled AOT to connect alarm hosts to remote alarm panels. When an alarm host is connected to a local Nortel Networks router, the local router can establish a TCP/IP connection with a remote router connected to an alarm panel. The local router receives the asynchronous data packet from the alarm host and sends it over the TCP/IP connection. When the remote router receives the packet, it strips the TCP/IP information and forwards the alarm information to the alarm panel.

Figure 1-1 shows the Nortel Networks polled AOT topology in a point-to-point network.

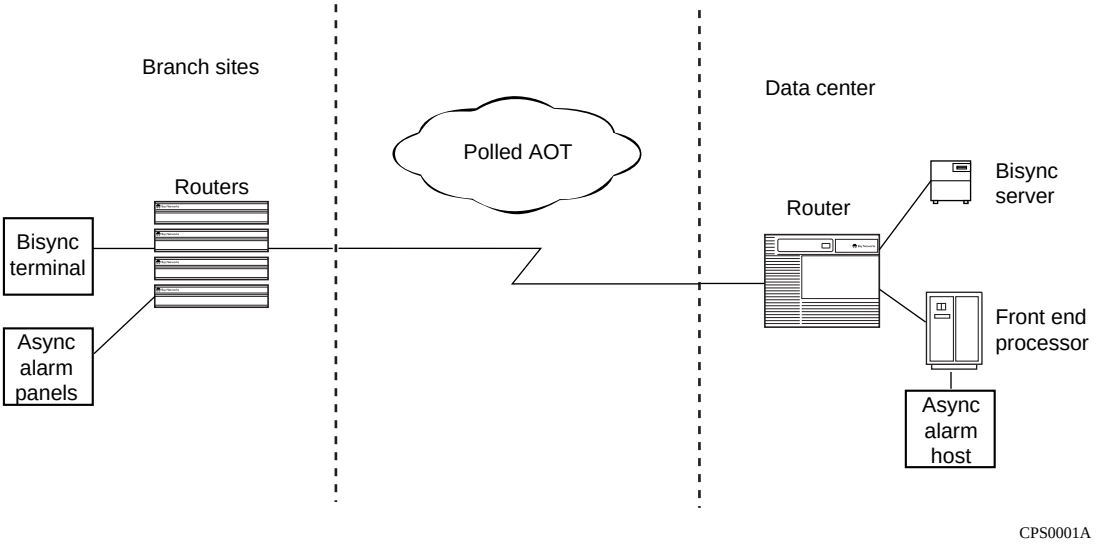

Figure 1-1. Nortel Networks Polled AOT Network Topology

Polled AOT Configurations on Nortel Networks Routers

To configure a Nortel Networks router for polled AOT, you use Site Manager's Configuration Manager on a PC or UNIX workstation. You configure polled AOT on a port-by-port basis. Table 1-1 lists the router platforms and the modules that support polled AOT.

Table 1-1. Polled AOT Router and Module Support

Router platform	AOT supported on these modules	Port labels
Access Node (AN®)	Any module that includes 2S or 3S in the module name	COM1 to COM3
Access Stack Node (ASN™)	Dual Sync Quad Sync	COM1, COM2 COM1 to COM4
Advanced Remote Node™ (ARN™)	Serial Adapter TRI Serial Expansion Ethernet/TRI Serial Token Ring/TRI Serial Ethernet/TRI Serial/DCM	COM2 COM3 to COM5 COM3 to COM5 COM3 to COM5 COM3 to COM5
Backbone Link Node-2 (BLN-2®)	Octal Sync	COM1 to COM8
Backbone Concentrator Node (BCN®)	Octal Sync	COM1 to COM8

To create a polled AOT configuration, you must perform the following steps:

1. Designate one router as the primary and the other router as the secondary.

   In multipoint configurations, you can designate additional secondary routers.

2. Configure a router AOT Peer Table, where you define which router (primary or secondary) will initiate the TCP connection.

3. Edit the polled AOT line parameters.

For details about starting polled AOT, see Chapter 2, "Enabling Polled AOT."

Polled AOT Device Support

BayRS Version 12.0 supports polled AOT on the following alarm systems:

- ADT (RS-232 Asynchronous Protocol)
- Mosler 16 PT RTU
- Mosler RTU 2000

Chapter 2
Enabling Polled AOT

This chapter describes how to enable polled AOT. It assumes that you have read *Configuring and Managing Routers with Site Manager* and completed the following steps:

1. Opened a configuration file
2. Specified the router hardware, if this is a local-mode configuration file
3. Selected the connector on which you are enabling polled AOT

You enable polled AOT on your Nortel Networks router by configuring it on each interface you want to use for polled AOT transmissions. When you enable polled AOT, you must specify certain parameters; the Configuration Manager supplies default values for the other parameters. If you want to edit parameters, see Chapter 3, “Editing Polled AOT Parameters.” Appendix A describes the polled AOT parameters.

This chapter contains the following sections:

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Starting Polled AOT on an Interface	2-2
Specifying the Polled AOT Interface Parameters	2-3
Creating the Polled AOT Peer Table	2-4
Completing the Configuration	2-7

Starting Polled AOT on an Interface

To start polled AOT on an interface, you begin at the WAN Protocols window (Figure 2-1). The WAN Protocols window opens when you select the interface on which you want to configure polled AOT.

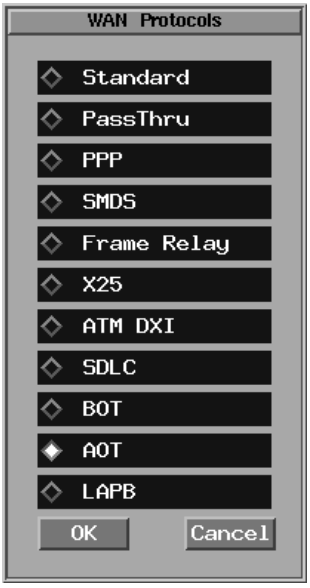

Figure 2-1. WAN Protocols Window

Site Manager Procedure	
You do this	**System responds**
1. In the WAN Protocols window, select **AOT.**	
2. Click on **OK**.	The Edit AOT Interface window opens (Figure 2-2).

Specifying the Polled AOT Interface Parameters

The Edit AOT Interface window (Figure 2-2) allows you to configure individual interfaces for polled AOT transmissions. Specifically, you must perform the following steps:

1. Configure the interface to a primary or secondary router.
2. Specify the type of interface: point-to-point or multipoint.
3. Specify the TCP connection parameters.

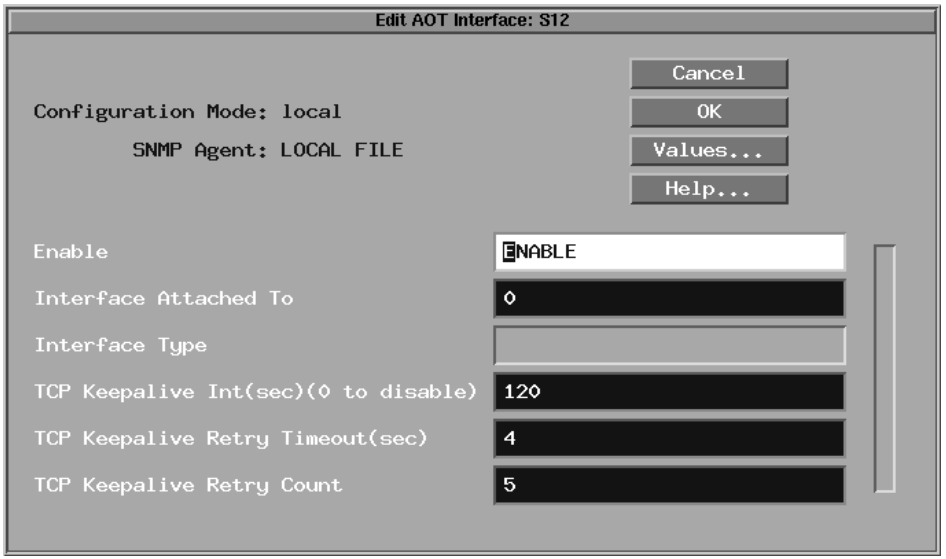

Figure 2-2. Edit AOT Interface Window

To configure a pair of routers to transmit polled AOT data, you designate one router as the primary and the other router as the secondary. (For example, the primary router is the one connected to the alarm host.)

Use the Interface Attached To parameter to specify whether the router you are configuring is a primary or secondary router. The primary router transmits polls to a secondary router over the active TCP connection. The secondary router receives and responds to polls from the primary router.

Use the Interface Type parameter to specify whether the interface has one or many TCP connections. Point-to-point provides one TCP connection to the peer router. Multipoint provides many TCP connections to one or more peer routers. A multipoint connection can also be one TCP connection to multiple peer routers. A primary interface can have either a point-to-point or multipoint connection. A secondary interface can have only a point-to-point connection to the primary router.

Polled AOT transmissions use TCP timers and keepalive settings to ensure that there is an active TCP connection between two routers before any transmission attempt. Because asynchronous transmissions are relatively slow (300 b/s to 9600 b/s), polling ensures that the secondary router is available for asynchronous transmission.

Site Manager Procedure	
You do this	**System responds**
1. In the Edit AOT Interface window, edit the following parameters: • Enable • Interface Attached To • Interface Type • TCP Keepalive Int • TCP Keepalive Retry Timeout • TCP Keepalive Retry Count Click on **Help** or see the parameter descriptions beginning on page A-1.	
2. Click on **OK**.	The AOT Peer Table Configuration window opens (Figure 2-3).

Creating the Polled AOT Peer Table

This section explains how to set up the AOT Peer Table, which directs packets to a specific port. The AOT Peer Table contains the following information:

- The IP address of the remote peer router
- The router that will initiate the connection
- The TCP listen port address of the local or remote peer router

You create the AOT Peer Table using the AOT Peer Table Configuration window (Figure 2-3).

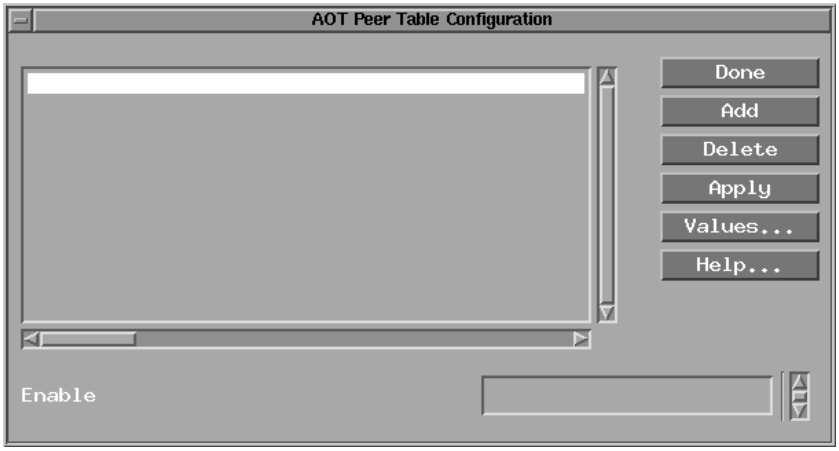

Figure 2-3. AOT Peer Table Configuration Window

Site Manager Procedure	
You do this	**System responds**
1. In the AOT Peer Table Configuration window, click on **Add.**	The Add AOT Peer Entry window opens (Figure 2-4).
2. In the Add AOT Peer Entry window, edit the following parameters: • Peer IP Address • Connection Originator • Local TCP Listen Port • Peer TCP Listen Port Click on **Help** or see the parameter descriptions beginning on page A-4.	
3. Click on **OK**.	The AOT Peer Table Configuration window opens, displaying the AOT Peer Table entry you just added.
4. Click on **Add** to specify additional peers if this is a multipoint configuration, then edit the parameters from step 2. Click on **OK** when you are finished.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
5. Select an entry and click on **Delete** to remove it from the AOT Peer Table.	The entry disappears from the AOT Peer Table Configuration window.
6. Click on **Done**.	The Configuration Manager window opens.

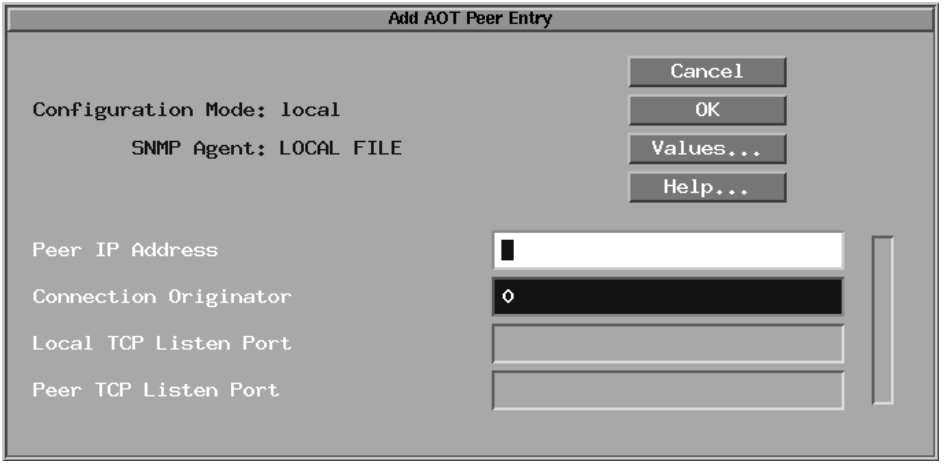

Figure 2-4. Add AOT Peer Entry Window

In the AOT Peer Table, you use the Connection Originator parameter to define which router (primary or secondary) will initiate the TCP connection. You set the Connection Originator parameter to the local router (Self) or the remote peer router (Partner).

If the primary router is initiating the connection, you specify the IP address and TCP port number of the remote peer router. If the secondary router is initiating the connection, you specify the IP address and port number of the local TCP listen port.

Completing the Configuration

To complete the polled AOT configuration, you must set the WAN serial interface type to asynchronous transmission. You set the WAN Serial Interface Type parameter using the Edit SYNC Parameters window (Figure 2-5).

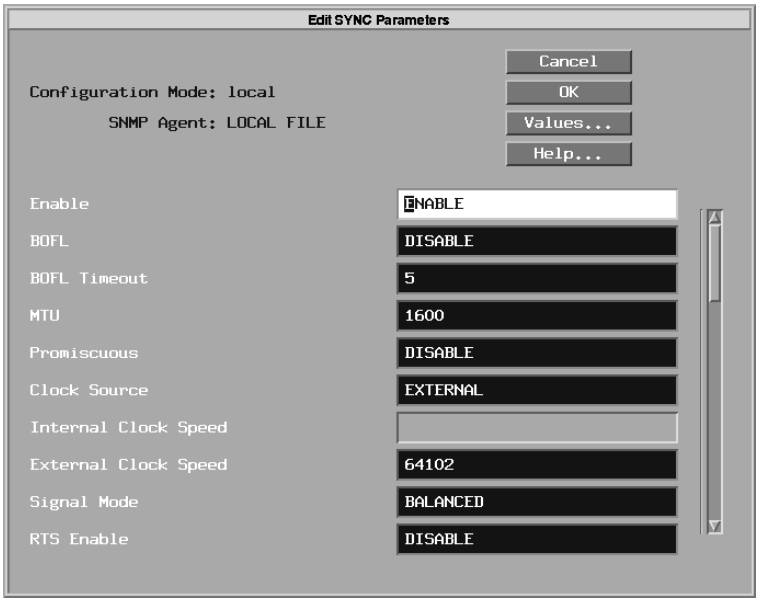

Figure 2-5. Edit SYNC Parameters Window

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the interface you want to edit.	The Edit Connector window opens.
2. In the Edit Connector window, click on **Edit Line**.	The Edit SYNC Parameters window opens (Figure 2-5).
3. Scroll down to the WAN Serial Interface Type parameter. Click on **Values** and select **PASYNC**. Click on **Help** or see the parameter description on page A-6.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
4. Click on **OK.**	The Edit Connector window opens.
5. Click on **Done**.	The Configuration Manager window opens.

You can also edit the Pasync Parity Type, Pasync Data Bits, Pasync Stop Bits, and Pasync Baud Rate parameters from the Edit SYNC Parameters window. See Appendix A for information about these parameters.

Chapter 3
Editing Polled AOT Parameters

After you configure polled AOT for the first time, you may need to edit the AOT interface or AOT Peer Table parameters. The following sections describe how to edit a polled AOT configuration:

Section	Page
Editing the AOT Interface Parameters	3-2
Editing the AOT Peer Table	3-4
Disabling the AOT Peer Table	3-5
Removing Polled AOT from the Router	3-6

Editing the AOT Interface Parameters

This section describes how to edit the AOT interface parameters from the AOT Interfaces window (Figure 3-1).

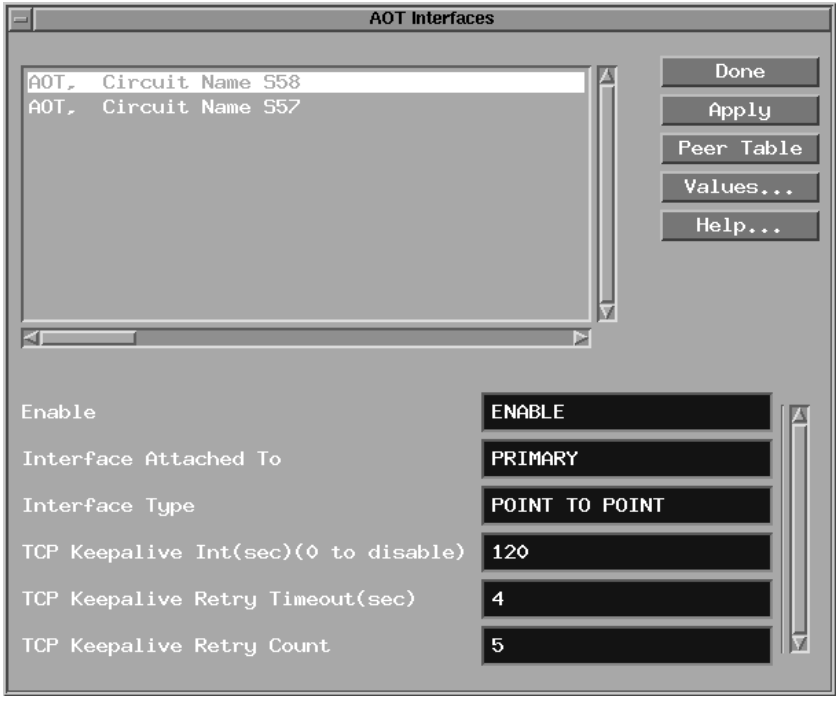

Figure 3-1. AOT Interfaces Window

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, choose **Protocols > AOT > Interfaces.**	The AOT Interfaces window opens (Figure 3-1).
2. In the AOT Interfaces window, edit the following parameters: • Enable • Interface Attached To • Interface Type • TCP Keepalive Int • TCP Keepalive Retry Timeout • TCP Keepalive Retry Count Click on **Help** or see the parameter descriptions beginning on page A-1.	
3. Click on **Apply** to save your changes.	
4. Click on **Done**.	The Configuration Manager window opens.

Editing the AOT Peer Table

This section describes how to edit the AOT Peer Table from the AOT Peer Table Configuration window (Figure 3-2). The AOT Peer Table contains the remote peer's IP address and port information.

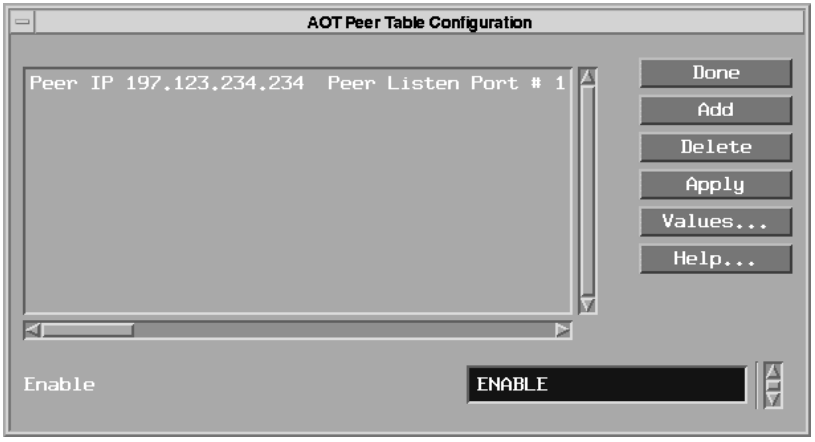

Figure 3-2. AOT Peer Table Configuration Window

Site Manager Procedure	
You do this	**System responds**
1. In the AOT Interfaces window (Figure 3-1), select an entry and click on **Peer Table**.	The AOT Peer Table Configuration window opens (Figure 3-2).
2. Click on **Add** to specify additional peers if this is a multipoint configuration.	The Add AOT Peer Entry window opens (Figure 2-4 on page 2-6).
3. In the Add AOT Peer Entry window, edit the following parameters: • Peer IP Address • Connection Originator • Local TCP Listen Port • Peer TCP Listen Port Click on **Help** or see the parameter descriptions beginning on page A-4.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
4. Click on **OK**.	The AOT Peer Table Configuration window opens, displaying the AOT Peer Table entry you just added.
5. Select an entry and click on **Delete** to remove it from the AOT Peer Table.	The entry disappears from the AOT Peer Table Configuration window.
6. When you are finished, click on **Done**.	The AOT Interfaces window opens.
7. Click on **Apply** to save your changes.	
8. Click on **Done**.	The Configuration Manager window opens.

Disabling the AOT Peer Table

If you want to stop TCP data transmissions to a peer router, you disable the router's AOT Peer Table from the Edit AOT Global Parameters window (Figure 3-3).

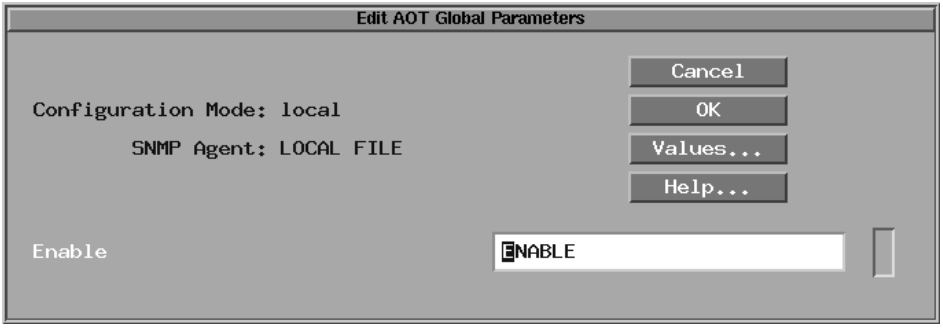

Figure 3-3. Edit AOT Global Parameters Window

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, choose **Protocols > AOT > Global**.	The Edit AOT Global Parameters window opens (Figure 3-3).
2. Click on **Values**.	The Values Selection window opens.
3. Select **Disable**.	
4. Click on **OK**.	The Configuration Manager window opens.

Removing Polled AOT from the Router

Site Manager allows you to remove a polled AOT configuration from the router. When you remove a polled AOT configuration, Site Manager removes it from all interfaces you have configured for polled AOT.

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, choose **Protocols > AOT > Delete AOT.**	A dialog box opens, displaying the prompt, “Do you really want to delete AOT?”
2. Click on **OK**.	Site Manager removes polled AOT from the router and the Configuration Manager window opens.

Appendix A
Polled AOT Parameters

AOT Interface Parameters

Parameter: Enable

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: Enable

Options: Enable | Disable

Function: Enables or disables polled AOT on an interface.

Instructions: Select Enable to run polled AOT on this interface. Select Disable to stop polled AOT services on this interface.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.2

Parameter: Interface Attached To

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: 0

Options: Primary | Secondary

Function: Specifies whether this interface connects to a host (primary connection) or a control unit (secondary connection).

Instructions: Select Primary or Secondary.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.7

Parameter: Interface Type

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: None

Options: Point-to-Point | Multipoint

Function: Specifies whether the interface has one or many TCP connections. Point-to-point provides one TCP connection to the peer router. Multipoint provides many TCP connections to one or more peer routers. A multipoint connection can also be one TCP connection to multiple control units (CUs). A primary interface can have either a point-to-point or multipoint connection. A secondary interface can have only a point-to-point connection.

Instructions: If this is a primary interface, select Point-to-Point or Multipoint; if this is a secondary interface, select Point-to-Point.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.6

Parameter: TCP Keepalive Int (sec)

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: 120

Options: 0 to 86400 seconds

Function: Specifies how often the local router sends a signal to the remote peer router to verify that the peer router is working correctly and can receive messages.

If the remote peer router does not acknowledge a keepalive packet, the local router retransmits the keepalive packet. You should set the keepalive interval based on the total time it takes to send and receive acknowledgment from the remote peer router.

Since keepalive packets are sent only on idle lines, increasing the keepalive interval may decrease the cost of an idle network. For busy networks, the keepalive interval is not necessary because frequent TCP transmissions perform the same function as a keepalive interval.

Instructions: Specify an appropriate value for the network. Nortel Networks recommends that you set this parameter to the same value as the remote peer router to maintain synchronization.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.9

Parameter: TCP Keepalive Retry Timeout (sec)

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: 4

Options: 0 to 600 seconds

Function: Specifies the maximum amount of time between each successive retransmission of keepalive packets. If the local router does not receive an acknowledgment within the TCP keepalive retry timeout, it retransmits the keepalive packet. The router continues to retransmit the keepalive packet at every TCP keepalive retry timeout until it receives an acknowledgment from the remote peer router, or until TCP reaches the keepalive retry count setting.

Instructions: Specify a value in the range 0 to 600.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.10

Parameter: TCP Keepalive Retry Count

Path: Configuration Manager > Protocols > AOT > Interfaces

Default: 5

Options: 0 to 99 seconds

Function: Specifies the number of times that TCP attempts to establish or maintain a connection. If TCP does not receive an acknowledgment after a series of retries, TCP makes no additional attempts to establish a connection.

Instructions: Specify a value in the range 0 to 99 seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.5.21.2.1.11

AOT Peer Table Parameters

Parameter: **Enable**

Path: Configuration Manager > Protocols > AOT > Interfaces > **Peer Table**
Default: Enable
Options: Enable | Disable
Function: Enables or disables the TCP connection to the remote peer router.
Instructions: Select Enable or Disable.
MIB Object ID: 1.3.6.1.4.1.18.3.5.21.3.1.2

Parameter: **Peer IP Address**

Path: Configuration Manager > Protocols > AOT > Interfaces > **Peer Table** > **Add**
Default: None
Options: Any valid IP address
Function: Specifies the IP address of the peer router.
Instructions: Specify the peer router's IP address in dotted-decimal notation.
MIB Object ID: 1.3.6.1.4.1.18.3.5.21.3.1.5

Parameter: **Connection Originator**

Path: Configuration Manager > Protocols > AOT > Interfaces > **Peer Table** > **Add**
Default: 0
Options: Self | Partner
Function: Determines whether this router (Self) or the remote peer router (Partner) initiates the TCP connection.
Instructions: Select Self or Partner. Specify the opposite value for this parameter on the other router.
MIB Object ID: 1.3.6.1.4.1.18.3.5.21.3.1.6

Parameter: Local TCP Listen Port

Path: Configuration Manager > Protocols > AOT > Interfaces > **Peer Table** > **Add**

Default: None

Options: 1000 to 9999

Function: Specifies the local router's TCP port number, which the remote peer router will use to establish a TCP connection. This parameter is available only when you set the Connection Originator parameter to Partner.

Instructions: Specify a valid, available port number for this router. Be sure to use the same value for the Peer TCP Listen Port parameter on the remote peer router.

MIB Object ID: 1.3.6.1.4.1.18.3.5.18.3.1.7

Parameter: Peer TCP Listen Port

Path: Configuration Manager > Protocols > AOT > Interfaces > **Peer Table** > **Add**

Default: None

Options: 1000 to 9999

Function: Specifies the remote peer router's TCP port number, which the local router uses to establish a TCP connection. This parameter is available only when you set the Connection Originator parameter to Self.

Instructions: Specify a valid, available port number for the remote peer router. Be sure to use the same value for the Local TCP Listen Port parameter on the local router.

MIB Object ID: 1.3.6.1.4.1.18.3.5.18.3.1.8

Asynchronous Parameters

Parameter: **WAN Serial Interface Type**

Path: **COM** Connector > **Edit Line** > Edit SYNC Parameters

Default: None

Options: SYNC | ASYNC | PASYNC

Function: Determines whether this interface uses synchronous, asynchronous, or polled asynchronous communications.

Instructions: Click on Values and select SYNC, ASYNC, or PASYNC.

MIB Object ID: 1.3.6.1.4.1.18.3.4.5.1.109

Parameter: **Pasync Parity Type**

Path: **COM** Connector > **Edit Line** > Edit SYNC Parameters

Default: Even

Options: Odd | Even | High | Low | None

Function: Sets the error-detection method for isolating altered or damaged polled AOT packets during transmission. Asynchronous equipment typically adds a parity bit to the end of a packet before transmission. This allows the receiving router to detect a transmission error if it receives a packet with an unexpected parity.

Instructions: Click on Values and select a value that is appropriate for your network.

MIB Object ID: 1.3.6.1.4.1.18.3.4.5.1.116

Parameter: **Pasync Data Bits**

Path: **COM** Connector > **Edit Line** > Edit SYNC Parameters

Default: Eight

Options: Five | Six | Seven | Eight

Function: Sets the length of a polled AOT packet to a specific number of data bits.

Instructions: Click on Values and select a value that is appropriate for your network.

MIB Object ID: 1.3.6.1.4.1.18.3.4.5.1.117

Parameter: **Pasync Stop Bits**

Path: **COM** Connector > **Edit Line** > Edit SYNC Parameters

Default: Two

Options: One | Two

Function: Sets the interval at the end of a transmitted polled AOT packet, allowing the receiving router to pause before accepting the next packet. More stop bits create a longer pause at the receiving router.

Instructions: Click on Values and select a value that is appropriate for your network.

MIB Object ID: 1.3.6.1.4.1.18.3.4.5.1.118

Parameter: **Pasync Baud Rate**

Path: **COM** Connector > **Edit Line** > Edit SYNC Parameters

Default: 600

Options: 150 | 300 | 600 | 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600

Function: Sets the speed for transmission of polled AOT packets between primary and secondary routers over a TCP connection.

Instructions: Click on Values and select a baud rate that is appropriate for your network.

MIB Object ID: 1.3.6.1.4.1.18.3.4.5.1.119

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